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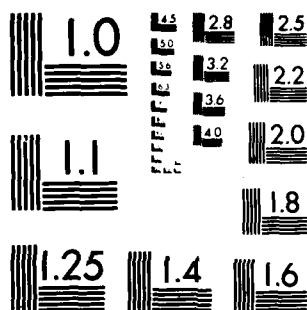
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VOLUME I

CULTURAL RESOURCES EVALUATION OF THE  
VANDENBERG AIR FORCE BASE  
SECURITY CLEAR ZONES  
SANTA BARBARA COUNTY, CALIFORNIA

by

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Under the Direction of  
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Principal Investigators

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## ABSTRACT

During February 1981, the Office of Public Archaeology, Social Process Research Institute, University of California at Santa Barbara conducted an intensive survey and limited testing program within the Security Clear Zones of six small military installations on Vandenberg Air Force Base, Santa Barbara County, California. The purpose of the work was 1) to locate, record, and evaluate archaeological sites in terms of National Register significance, and 2) to provide mitigation alternatives that would aid in avoiding adverse impacts at known sites in the course of by-annual brush clearing around the military installations.

No previously unrecorded sites were identified, however, four known seasonally occupied prehistoric sites dating from approximately 6,000 B.C. to A.D. 1,500 were investigated and evaluated. It was confirmed that site SBa-1127 was located outside the project impact area. Another site, SBa-537, had been totally destroyed years earlier by construction within the right-of-way. The upper depositional contexts of SBa-793 and 917 were so extensively disturbed by historic construction that there is little integrity in terms of National Register Eligibility criteria. In other areas of these two sites, intact subsurface deposits are suspected but were not documented. The report concludes with recommendations for brush clearing, looting control, rodent control, and the handling of isolated and disturbed surface archaeological materials.

## ACKNOWLEDGMENTS

Many individuals contributed their energies and expertise during the course of this project, making this technical report possible.

The field crew consisted of James Consler, Thomas Hakansson, and Albert Centeno, who also acted as Native American observer. Chia-Yun Yu was on the lab crew. Paula Dowling drew Figure 1, Albert Bixler and Anabel Ford prepared the tables.

Paul Heuston of the Department of Anthropology at UCSB provided access to equipment. Cheryl Aldrich and Roxann Rowsey of the Office of Public Archaeology, UCSB, managed the books and typed the manuscript, respectively. As always, the quality of their work is without equal.

Efforts of Base Security personnel at Vandenberg Air Force Base proved essential in gaining access to security installations to conduct fieldwork. In this regard, we thank Capt. Dolly for permission to take photographs in restricted areas, TSGT. Tom Coplin for coordinating access at each installation, and SGT. Miller for aiding access efforts at SLC-3 and SLC-4. In particular, we must thank SRA George Randly who escorted the field crew at all times inside installations, and enthusiastically participated in fieldwork. We hope the experience was as rewarding for him as it was for us.

Holly Dunbar of Interagency Archeological Services in San Francisco facilitated communication between Vandenberg AFB and OPA staff, aiding in the acquisition of important data. She also graciously gave valuable advice during a minor field crisis.

Jim Johnston of the Environmental Quality Office at Vandenberg AFB provided grading plans to SLC-3 and VTS. TSGT Gillespie provided essential data on previous impacts at the VTS installation.

Pandora E. Snethkamp and Michael A. Glassow of the Office of Public Archaeology and Department of Anthropology at UCSB supervised and reviewed the progress and product of this research.

Brian D. Haley and David F. Stone of the Office of Public Archaeology directed all aspects of field and lab work, conducted background research, drafted maps, and wrote and assembled the report. Although we made most of the operational decisions, the final product could not have been delivered without the excellent assistance received from all of the people mentioned above. We sincerely thank them all.

## 1.0 INTRODUCTION

This report is the result of archaeological research conducted at six military installations at Vandenberg Air Force Base (VAFB), Santa Barbara County, California. The research was performed by staff of the Office of Public Archaeology (OPA), a research unit of the Social Process Research Institute (SPRI), University of California at Santa Barbara (UCSB), under a contract awarded by Interagency Archaeological Services Division, Heritage Conservation and Recreation Service, San Francisco.

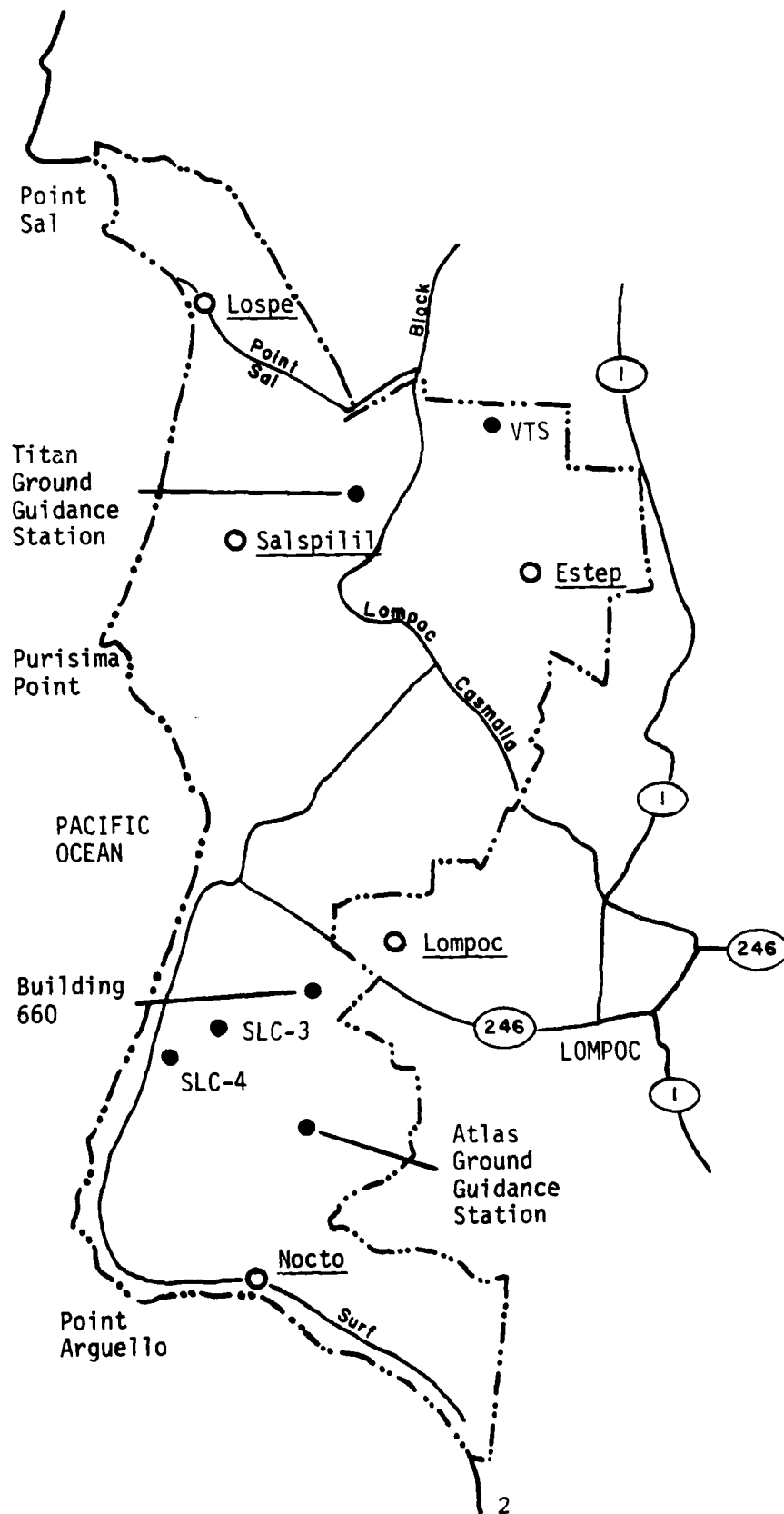
Research was conducted to provide the U. S. Air Force with management data on cultural resources in and overlapping the security clear zones surrounding the following installations at VAFB (Map 1):

- 1) VTS;
- 2) Titan Ground Guidance Station;
- 3) Building 660;
- 4) SLC-3;
- 5) SLC-4; and
- 6) Atlas Ground Guidance Station.

Air Force regulations require vegetation in these zones be kept at a maximum height of eight inches within a corridor 60 feet wide, 30 feet on either side of a security fence around each facility. Presently the height requirements are maintained by scraping the vegetation with crawler tractors. Unless other alternatives prove more feasible, this requirement is to be met by twice-a-year mechanical mowing of the vegetation within the security clear zones.

The objectives of this project were to identify, record, and assess visible prehistoric and historic archaeological sites within the security clear zones. State of California Archaeological Survey Forms were to be prepared or updated for each observed site, and National Register of Historic Places Forms will be completed for prehistoric sites which meet criteria for inclusion in the National Register. The project objectives were met by conducting background research of pertinent records, field investigation consisting of a pedestrian survey of the total 5.93 miles of 60 foot wide security clear zone corridor and excavation of 15 shovel test pits, and laboratory processing and analysis of materials recovered during fieldwork. Field and laboratory work was completed during the four days of February 17 through 20. Six 1"=400' topographic maps of the project areas are included under a separate cover.

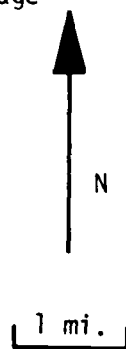
This archaeological project was conducted pursuant to the Reservoir Salvage Act of 1960 (P.L. 86-523; 74 Stat.



MAP 1

VAFB Security Clearance  
Zone in Lompoc Project Areas

- VAFB Boundary
- Project Area
- Historic Chumash Village



220), as amended by the Archaeological and Preservation Act of 1974 (P.L. 93-291; 16 U.S.C. 469 et seq.), with funding transferred from the U. S. Air Force to the Heritage Conservation and Recreation Service.

## 2.0 ENVIRONMENTAL SETTING

In his initial report detailing preliminary archaeological surface survey of approximately 35 miles of coastline and adjacent coastal plain on Vandenberg Air Force Base, Laurence Spanne (1971:5-9) identified three major environmental zones. The zones were defined on the basis of available natural resources and geographical attributes. The three zones are as follows: south or southwest-facing coastlines, west or northwest facing coastlines, and riverine or major stream valleys.

The six distinct security clear zones that comprise the total project and study area, including archaeological sites SBa-537, 793, and 917, are located within the west-facing coastline zone. Each security clear zone investigated during the project will be discussed separately beginning with south base areas and continuing with northern investigated areas (Map 1). A general environmental description will precede a more detailed listing of vegetation ground cover, surface visibility, and soils found within the individual project areas.

### 2.1 SLC-4

The security clear zone surrounding SLC-4 follows the sloping contours of foothills that rise above the coastal plain inland from the west-facing coastline (Map 2). Spanne (1971:9) describes this type of foothill area as a chaparral ecozone or coastal sage scrub community. Small stands of Mock Heather (Haploppaus ericoides), and Black Sage (Salvia melifera) are found that support mule deer (Odocoileus hemionus) and smaller mammals, such as brush rabbits (Sylvilagus bachmani) (Glassow et al, 1976:31). Considerable numbers of Grizzly and Black bear also lived in this area before their extinction. The southern boundary of the SLC-4 security fence slopes down the north side of Spring Canyon. A perennial creek are located at the base of the canyon, approximately 70 meters from the fence. Adjacent to the creek is found a stand of willows and marshy plants characteristic of a riparian woodland habitat. This source of water may have attracted animal populations, and in turn, prehistoric Indian exploitation. The location of SBa-537 on the northern slope of Spring Canyon, straddling the security clear zone, might be explained by the available floral and faunal resources within the environment described above. The same argument applies to SBa-1127, located south of SBa-537 on the southern slope of Spring Canyon, approximately 115 meters south of the SLC-4 security fence.

Vegetation Ground Cover: Interior side of fence-- approximately 60 percent common iceplant (Carpobrotus edulis), 20 percent planted grasses, and 10 percent indigenous sagebrush (Salvia sp.). Exterior side of fence--

bulldozing and grading have removed all vegetation.

Surface Visibility: Interior--where vegetation present, poor or fair. Exterior--excellent.

Soils: Homogenous medium brown marine and aeolian sand typical of the soils found inland from the coast north of Honda Canyon (Glassow et al, 1980:2-5).

## 2.2 SLC-3

The project area is situated in an environment similar to that found at SLC-4 (Map 3). SLC-3 is located on top of the foothills overlooking the coastal plain and west-facing coastline north of Honda Canyon. Bear Creek, a perennial water source, is located on the southwestern slope below the security clear zone, approximately 325 meters from the security fence.

Vegetation Ground Cover: Interior--approximately 20 percent iceplant, 30 percent natural chaparral vegetation, 50 percent bulldozed in order to create a firebreak lacking vegetation. Exterior--completely graded and cleared for firebreak.

Surface Visibility: Interior--where vegetation present, poor or fair. In firebreak area, excellent. Exterior--excellent.

Soils: Aeolian sandy soil similar to those found at SLC-4.

## 2.3 Atlas Ground Guidance Station

This installation is located approximately 325 meters above sea level and is inland from the west-facing coastline (Map 4). It is surrounded by a pine and manzanita forest. The project area surrounding the station has been completely altered by construction.

Vegetation Ground Cover: Interior--ninety five percent paved with asphalt for driveways or parking areas, five percent iceplant. Exterior--soils have been graded, or fill has been placed so that an appreciable slope has been created. Iceplant occurs around the entire periphery of the fence for a distance of at least 20 meters.

Surface Visibility: Interior--poor. Exterior--poor.

Soils: light brown shaley sand.

## 2.4 Building 660

Located on top of the Santa Ynez Ridge at an elevation of 125 meters above sea level, the installation is east of SLC-3 and farther inland from the west-facing coastline (Map 5). Vegetation in this area is typical of the chaparral ecozone.



Vegetation Ground Cover: Interior--completely paved with asphalt. Exterior--twenty five percent asphalt, 75 percent gravel rock bed clearly associated with grading and construction activities.

Surface Visibility: Interior--none. Exterior--excellent in gravel rock bed.

Soils: light brown shaley sand.

## 2.5 Titan Ground Guidance Station

This installation houses Buildings 1850, 1852, 1853, 1856, and 1870-1878. It is located inland from a west-facing coastline between 125 and 150 meters above sea level in the Casmalia Hills (Map 6). A chaparral vegetation community surrounds the project area.

Vegetation Ground Cover: Interior--approximately 30 percent iceplant, 20 percent paved with asphalt, 50 percent cleared and graded for dirt road immediately inside fence. Exterior--approximately 60 percent iceplant, 40 percent sagebrush, and shale debris.

Surface Visibility: Interior--poor in areas of iceplant cover, excellent in graded roadway. Exterior--poor to fair.

Soils: Light brown shaley sand.

## 2.6 VTS

The VTS facility is located northeast of the Titan Ground Guidance Station approximately 320 meters above sea level on top of a northwest-southeast trending ridge in the Casmalia Hills (Map 7). A soft chaparral community defined by Spanne (1971:7, Map 2) exists here. It includes manzanita (*Arctostaphylos* sp.), wild cherry (*Prunus* sp.) and scrub oak (*Quercus dumosa*). All of these plants were known to have been exploited prehistorically. Mule deer and small mammals, including burrowing rodents, are present. A small drainage is located 150 meters southwest of the security clear zone. The ground surface within the project area has been radically altered during construction of the VTS facility.

Vegetation Ground Cover: Interior--30 percent planted grass, 20 percent natural chaparral vegetation, 30 percent asphalt, and 20 percent unvegetated sandy soil. Exterior--approximately 25 percent planted grass, 25 percent asphalt, and 50 percent bare sandy soil that has been mechanically cleared in order to create a firebreak.

Surface Visibility: Interior--poor to excellent. Exterior--in areas within firebreak, excellent; otherwise poor to fair.

Soils: Medium brown sand and loamy sand.

### 3.0 BACKGROUND RESEARCH

#### 3.1 Ethnographic Context

The VAFB security clear zone project areas are located within the Purisimeño Chumash Indian region. Ethnographic and ethnohistorical background for this region has been described in detail elsewhere (Glassow 1977:3-9; Greenwood 1978) and need not be repeated here. Chumash villages recorded by the Spanish have been at least tentatively correlated with known archaeological sites or specific localities (Map 1). Nocto (SBa-210) and Lompoc are the closest documented historic villages to the project areas on southern VAFB: Nocto, approximately 6 miles to the south, and Lompoc, 6 miles to the east. Lompoc is located in the Santa Ynez Valley, perhaps a mile or so west of the modern city of Lompoc, while Nocto is on a south-facing coast less than 4 miles southeast of Point Arguello. The historic Chumash villages of Salspilil and Estep (SBa-1105) located in the San Antonio Valley, and Lospe on the south-facing coastal plain south of Point Sal are within the north VAFB area. Salspilil is located approximately 1.2 miles southwest of the Titan Ground Guidance Station. Estep is 2.0 miles southeast from the Titan Ground Guidance Station and approximately 1.3 miles southeast of the VTS installation, while Lospe is 2.25 miles northwest of the Titan Ground Guidance Station and 3.1 miles northwest of VTS (Glassow et al, 1976:25 Map 1).

#### 3.2 Previous Archaeological Research

Systematic archaeological investigations at Vandenberg Air Force Base began in 1969 when Laurence Spanne began an archaeological survey of VAFB, eventually under a contract between the National Park Service and The Regents of the University of California at Santa Barbara (Spanne 1971,1974). This survey covered approximately forty percent of Base lands at varying degrees of intensity. Previously unrecorded sites were identified and were mapped along with 30 sites already listed in the University of California Archaeological Survey (Spanne 1971:1). By 1974, the number of recorded sites was over 400.

Archaeological research on Vandenberg Air Force Base continued in the summer of 1974 with the STS Archaeological Project. Personnel from the University of California, Santa Barbara, under the direction of Dr. Michael Glassow, carried out intensive survey and limited test excavations in areas potentially impacted by space shuttle construction. Additional extensive archaeological test excavation of selected sites in the STS Archaeological Project was undertaken during 1978-79.

As a result of the survey investigations performed from 1969-1974, Spanne (1974:7,8) classified all recorded archaeological sites within a functional typology that he hoped would provide a basis for reconstructing local prehistoric settlement patterns. Geographical characteristics and available natural resources surrounding the archaeological site were used to evaluate the potential importance of the cultural remains within a larger integrated cultural system. As stated above, SBa-537, 793, and 917 identified by Spanne in 1971, in addition to SBa-1127 recorded by Dr. Michael Glassow in 1974 (Glassow et al, 1976:96), are located within the west-facing coastline zone. Spanne states that this geographical zone has been exploited in a limited fashion by prehistoric populations. Evidence for activities other than hunting deer and small game are minimal, while traces of other subsistence activities and extended occupation are totally absent (Glassow et al, 1976:48). Spanne feels that the limited exploitation of these areas might be associated with the presence of Grizzly and Black Bear populations that were present as late as the 1860s (Glassow, et al, 1976:32). Also, a general lack of dependable resources is characteristic of the area, except in locations such as Spring Canyon and Bear Creek where sources of water stimulate the congregation of animal resources and offer a supplemental floral component to the chaparral vegetation (Glassow et al, 1976:32).

SBa-537 was recorded in 1971 and was found to have an area 275 m E-W by 90 m N-S (Spanne 1976:87). Although lithic chipping detritus and a trace of shell were noted on the surface, the site appeared to have no subsurface depth. Located near Surf Road, the site had been severely affected by the construction of firebreaks and numerous jeep trails. Spanne classified the site as a temporary hunting camp (Spanne 1971:10).

Spanne also recorded SBa-793 in 1971. Hammerstones, preforms, cores, Monterey chert chipping debris, fire-cracked rock, and a light density of shell were found on the surface. Based on these remains, Spanne classified it as a temporary hunting site, which, like SBa-597, might have been inhabited by families or small bands in order to exploit available local resources.

SBa-917, also recorded by Spanne in 1971, contained fire-cracked rock and chipping debris on the surface. A depth of 30 cm was hypothesized. Destruction of cultural materials resulted from construction activities of a radar dome and transmission line at the VTS installation. SBa-917 was also classified within Spanne's functional site typology as a temporary hunting campsite (Spanne 1971:10).

A survey team under the direction of Michael A. Glassow of the University of California, Santa Barbara identified and recorded SBa-1127 during the 1974 Vandenberg STS

Archaeological Project. A light density of chipping detritus and sparse shell remains with dimensions of 25 by 5 meters was observed in a roadcut immediately west of the site. Glassow (1974:96) classified SBA-1127 as a limited activity site which is probably analogous to the temporary hunting sites described by Spanne.

Archaeological investigations during the 1974 and 1978-79 Vandenberg STS Archaeological Programs included radiocarbon dating of small semi-sedentary or temporary sites in the vicinity of Honda Canyon, approximately two miles south of SBA-537 and SBA-1127. Dates from SBA-530, a larger sedentary village site in the Honda Canyon area, have been placed at ca. 6000 B.C. (Glassow et al, 1976, Fig 3). Neighboring SBA-670 has been dated at ca. 2000 B.C. (Glassow et al, 1980:7-39). Dates from the Late Period of ca. 1500 A.D. from SBA-670 and SBA-539 (Glassow et al, 1980:7-4,7-39) indicate at least intermittent periods of occupation throughout the known prehistory of the region. Although no temporally sensitive artifacts have been recovered from SBA-537 or SBA-1127, it is possible that cultural remains from these sites could represent exploitation of inland chaparral and riparian woodland resources during periods when SBA-530, 670, and 539 were occupied. Chronological placement of SBA-793 and SBA-917 on north VAFB cannot be speculated upon since the nearest dated archaeological remains are located at SBA-1010, approximately 3.5 miles southeast of the sites (Glassow et al, 1980: A2-2).

### 3.3 Previous Impacts

Effects of construction activities associated with military installations have altered the archaeological integrity of sites SBA-537, 793, and 917. In order to precisely evaluate these previous adverse impacts on site remains, copies of U. S. Air Force grading plans were requested from the VAFB Department of Environmental Quality. Unfortunately, only grading plans of SLC-3 and VTS construction activities were available, and these grading plans do not fully describe the observed design and extent of excavation associated with firebreak and roadcut construction at the SLC-3 and VTS installations. The impact of the firebreaks on archaeological remains is most difficult to interpret, and the dates of firebreak construction remain unclear. SLC-3 impacts will also be mentioned in relation to the sparse scatter of redeposited artifacts observed within the security clear zone surrounding that installation. Topographical information detailed in grading plans dating from 1958 to 1961 were compared to topographical representations of SLC-3 and VTS made between 1962 and 1966 after installation construction in order to evaluate the extent of impacts. Lastly, observable impacts on SBA-537 caused by SLC-4W construction activity will be evaluated, though grading plans are not available.

SBa-793

The site area located in the northwest part of the VTS installation has been affected by grading as well as filling activities. Topographical observations and contrasts between present and previous maps are summarized below.

- 1) Two feet of soil containing cultural materials were removed in the northern corner of the VTS installation, north of the Antenna Support Structure. A triangulation station (Pt. D-1 on the grading plan DO-AW-1495/18) in this area has an elevation of 948.49 feet. The same triangulation station has an elevation of 946.00 feet on the 1962 map. This grading must not have been carried out over a large area, because the 945 foot contour line on both the 1958 and 1962 maps is very similar. Vertical sections of the grading plan indicate that the Antenna Support Structure and VHF Telemetry Receiver Building to the south were built on the 945 foot elevation without any significant grading or cutting.
- 2) Placement of approximately two to three feet of fill is indicated in a broad area extending northwest beyond the security fence, and to a lesser extent, southward. This area is west and south of the graded area described above. The 940 foot contour elevation surrounding the Antenna Support Structure on the 1962 map appears to encompass a broader area than shown on the 1958 grading plan map. The 1958 grading plan map contour line extends approximately 100 feet northwest outside the fence, as compared to 200 feet in the 1962 map. In addition, there is an expansion of the contour line representation by at least 50 feet in a southerly direction between 1958 and 1962, though this is not described in the 1958 grading plan map (DO-AW-1495/18). If the fence was moved, the measuring reference point for plotting changes in contour lines would have been affected. However, significant differences in the depiction of the 940 foot contours are also found between the 1958 and 1962 maps when measuring the distance from the Antenna Support Structure. The contour line extends 200 feet northwest from the structure in the 1958 map compared to 400 feet in the 1962 map. It should also be mentioned that there are undoubtedly minor discrepancies between the 1958 and 1962 contour interval representations due to the differing scales of the maps (1"=40' and 1"=400' respectively). In any event, there are strong indications that filling activities have been carried out at SBa-793. It is unclear whether the fill was only moved from other areas of the site or whether additional soil was brought in.

- 3) A four foot deep sloping ditch of unspecified function was excavated east of the VHF Telemetry Receiver Building. The 1958 grading plan (DO-AW-1495/18) shows the proposed vertical section of the excavation gently sloping downward from a 939.50 foot elevation at the building's base (which is located directly upon the natural topography) for a distance of 70 feet where the bottom point of the 935.90 foot elevation is located. The sloping ditch continues in a southwesterly-northwesterly direction for another 280 feet, probably bisecting archaeological deposits.
- 4) A dirt road crossing the north and south areas of the installation in 1958 was situated in a northwest-southeast orientation, veering off to the southwest at the present location of the Antenna Support Structure and bisecting the present security fence southwest corner. It is unclear whether the road was located on top of the original ground surface or whether sub-surface grading was undertaken during its construction. Certainly significant disturbances and impacts on SBA-793 were caused during initial ground clearing for the dirt roadway, in addition to subsequent traffic of cars and larger transport vehicles.
- 5) Northeast of the security fence surrounding the Antenna Support Structure and VHF Telemetry Receiver Building is a "waste area," 160 feet northwest-southeast by 60-90 feet southwest-northeast. Activities associated with the origin of the waste area are unknown, although it is located within the SBA-793 site boundary. The impacts on site remains from activities associated with the waste area cannot be estimated.
- 6) The asphalt road situated southwest of the VTS security fence existed at the time the 1958 grading plans were drawn. The road was probably widened when the rest of the installation was built. No additional cutting was performed. However, the road bed was at an elevation of 931.88 feet, while the ground level adjacent to the road was at approximately 927 feet. The obvious grading in order to level the topography for road construction is not detailed in the grading plans, but the four foot difference between the road and the shoulder indicates probable impacts to SBA-793 because cultural remains are now observed along both sides of the roadbed.
- 7) A broad firebreak, approximately 10 meters in width, is situated parallel and adjacent to the northeast security installation fence. It begins at the northeast corner of the VTS fence line and continues southeast for approximately 200 m. SRA Randly (personal communication) relates that this firebreak was constructed approximately a year ago. A noticeable berm was

observed on the northern edge of the constructed fire-break. Perhaps as much as one to three feet of soil were removed and pushed northward, though this is not verifiable.

#### SBa-917

This site appears to have been located on top of a ridge that was separated from SBa-793 by a depression in the topography south of the VHF Telemetry Receiver Building, indicated on the 1958 grading plan map cited above. Impacts to SBa-917 include cutting and grading of the ridge in order to construct buildings in the southern area of the VTS installation.

- 1) The dirt road mentioned in SBa-793 impact descriptions continued south from the VHF Telemetry Receiver Building located within the SBa-917 site boundary. Similar disturbances to those inferred at SBa-793 are expected to have occurred at SBa-917.
- 2) The Receiving Area Support Building, located approximately 300 feet northwest of SBa-917 (Map DO-AW-1498/92), was built on a pad at 947.50 feet elevation. Approximately 7.5 feet of soil were graded from the original topography to create the pad.
- 3) The Data Acquisition and Processing Building is located 50 feet west of the Receiving Area Support Building. The structure had been built previous to the grading plan of 1958 at an elevation of 948 feet. It is hypothesized that approximately seven feet of soil had been removed here in preparing a pad for this building, since the structure is adjacent to the Receiving Area Support Building where 7.5 feet of soil had been removed from the original contour of the ridge.
- 4) A southern abutting addition to the Data Acquisition Processing Building was built after 1958. Grading plans of 1958 (AW-1948/54) indicated that the existing elevation of 948 feet was excavated another six feet to an elevation of 942 feet. The addition to the Data Acquisition Processing Building is directly north of the present SBa-917 site boundary, separated by an embankment created by construction.
- 5) The VTS Mess Hall Building is situated approximately 100 feet southwest of the present SBa-917 site boundary. Originally the area was a small knoll that sloped from 936 to 942 feet. The area was both graded and filled in order to create a platform for the building foundation at an elevation of 940 feet (Map DO-AW-1561/3). It is impossible to tell whether additional fill was used in leveling the area or local soil was only redistributed.

- 6) The asphalt road described in the SBa-793 impacts section continues parallel to the VTS installation southwest of SBa-917. Data are insufficient to determine whether SBa-917 extended into the area impacted by construction of the road.
- 7) Grading and other construction impacts associated with the UHF Telemetry Receiver Building probably severely impacted SBa-917. The structure was constructed before the 1958 grading plans were drawn (Map D.O. AW-1498/91). However, the elevation of the structure is several feet lower than the surrounding topography (as observed during project investigations), and could represent substantial impacts to the integrity of the site.
- 8) A broad firebreak, similar to the one described above for SBa-793, is located parallel and adjacent to the security fence line, beginning just northeast of SBa-917 site boundaries and continuing southeast for approximately 1600 ft. The firebreak is ten meters in width, and seems to have displaced approximately two to three feet of soil, which resulted in a berm located on the northeastern edge. This firebreak was also graded in 1980, according to SRA Randly.

In summary, impacts associated with construction activities located within the present SBa-917 site boundaries cannot be precisely evaluated since the construction was not included in the grading plans provided. However, it is possible that the construction of the Receiving Area Support Building, Data Acquisition Processing Building and addition, and the VTS Mess Hall structures visible on the 1966 topographic map (VAFB C-1 15/66), resulted in the complete destruction of the northern and southwestern extremes of the site.

### SLC-3

The nearest installation facility to the sparse redeposited artifact scatter observed on the southwest and southeast peripheries of the project area is the Launch Building Number 4. The structure is situated on the edge of a east-west ridge, while the Monterey chert chipping detritus were found approximately 800 and 400 feet downslope, respectively. A 1961 grading map (Y&O 935349 1/3) shows an elevation of between 460 and 520 feet for the proposed Launch Building Number 4. The 1966 topographic map of the area indicates an elevation of 482.50 feet for the pad on which the structure sits. It is apparent that substantial cutting and grading was associated with the construction.

Firebreaks have been constructed on both sides of the SLC-3 security fence at some unknown point in time. The



firebreaks are adjacent and parallel to the fence starting at the southeast corner, continuing south of the southwest corner of the fence, and then continuing northwest for approximately 1600 feet. Berms are evident on the edges of the firebreak, and approximately one to two feet of soil were removed.

#### SBa-537

Although no grading plans were supplied, obvious impacts on cultural remains within the site have occurred. Substantial disturbances must have occurred before 1971, when Spanne performed his initial survey of the area. The construction of firebreaks--at some time before 1971--has transformed the sloping topography into a series of terraces outside the security fence. Several jeep roads to the west and south of the site have caused immeasurable damage to the integrity of archaeological deposits.

A series of facilities associated with the SLC-4W installation are situated within the SBa-537 site boundary defined by Spanne in 1971. It is impossible to judge whether these were constructed after 1971 or whether Spanne failed to mention their presence. Facilities have been built on a slope requiring unknown amounts of cutting and filling. Evidence of redistributed soils in the form of berms is present at the base of the concrete foundation slab. Concrete and plaster chunks are scattered in this area as well. An escape tunnel has been excavated and constructed southwest of the SLC-4W. In addition, there is a sidewalk leading from the opening of the tunnel to a ventilation vent. The total impact from construction activities on the integrity at the site has been very extensive, although this inference is based solely on surface and sub-surface observations made during the present investigation. The precise nature and sub-surface extent of these impacts cannot be determined without grading plans.

## 4.0 DATA COLLECTION PROCEDURES

### 4.1 Field Procedures

Two data collection procedures were carried out in the field: intensive pedestrian survey, and shovel test pit excavation. Pedestrian survey was conducted in a similar manner at each installation, but shovel test pits were excavated only when subsurface data were necessary to evaluate areas suggested to be sensitive by survey data.

The field crew consisted of two co-directors, two archaeological technicians, and (except for the first day) a Native American observer with previous archaeological experience. The Base Security escort accompanying crew members inside facility yards gave unsystematic yet constructive aid during survey after he received artifact identification training at the first installation.

Each security clear zone was simultaneously surveyed inside and outside the security fence by splitting the field crew into two units, each supervised by one of the co-directors. Each group consisted of not less than two individuals spaced 3 to 5 meters apart, walking zigzag transects paralleling the security fence. The two groups walked in the same direction to facilitate communication, starting and finishing at the facility yard entry point. However, the groups were seldom able to proceed at the same pace due to visibility differences, obstructing internal yard fences, and safety and security procedures. Shovels were used to clear vegetation systematically every 15-25 meters when visibility was unsatisfactory. The survey crews kept within the security clear zones unless cultural materials were observed on the surface. When this occurred, the extent of the deposit inside and outside the facility yard was determined. To do this, one or two people turned and walked zigzag transects every 15-25 meters away from the security fence.

Initially, surface distributions were marked with pinflags, then recorded on 1"=400' maps after survey at an installation was completed. However, the additional walking time involved in this procedure was excessive; thus, at all but the first installation surveyed, distributions of cultural materials were recorded directly onto maps during the course of reconnaissance.

Other data were also recorded on maps during the course of survey or in notebooks following surveys at individual installations. These data are percentage surface visibility and vegetation types, type and location of visible previous

cultural disturbances, rodent activity, soil types, and the position of isolated artifacts.

Archaeologically sensitive areas at Titan Ground Guidance Station, VTS, and SLC-4 were reexamined after initial surveying was completed using more thorough pedestrian survey and shovel test pit (STP) excavation. STPs were excavated in 20 cm levels to a maximum depth of one meter and were 35-40 cm in diameter. Some sidewall collapse is a common trait of STPs, hence there is a sizeable range of error for the vertical provenience of cultural materials from lower levels of STPs. All soils were screened through 1/8 inch mesh. STPs were numbered consecutively throughout the course of the project.

An outcrop of poor quality Monterey chert 8 m north of the east corner of the security fence at Titan Ground Station was re-investigated in detail to determine if cultural materials were present, delimit its northern boundary, and test subsurface content and depth. Four individuals participated, and one STP was excavated to bedrock.

SBa-537, overlapping the southwest corner of the security fence at SLC-4, was revisited in order to assess visible previous impacts from construction and firebreak clearance, delimit the present boundary of the surface scatter of cultural materials, photograph, and test for subsurface content and intactness of deposits. With the entire crew participating, two STPs were excavated within the internal security clear zone and one STP within the external security clear zone.

A more substantial interpretive problem exists at the VTS facility where two prehistoric sites overlap the security clear zone. SBa-793 at the northwest end of the installation and SBa-917 at the southeast and were revisited twice to collect additional data in hopes of clarifying the current site boundaries and integrity of the deposits. Both areas were partially resurveyed to identify external site boundaries and the limits of recent historic impacts from construction activities. Six STPs were excavated in SBa-917 to test depth and subsurface integrity, one was placed in the external security clear zone, three in the internal clear zone, and two more were excavated within the facility yard but not in the clear zone. Five STPs were dug at SBa-793 to collect depth and integrity data. Three of these were located within the internal security clear zone, one within the external clear zone, and one STP was excavated 15 meters outside the fenceline in an area reportedly unaffected during previous construction and grading activities. Additionally, photographs were taken of both sites. Some photographs of the previous construction activities were shown to the co-directors but could not be released (U. S. Department of Air Force, n.d.), and two informants commented

extensively on looting, previous construction activities, and on artifacts observed previously in the project area.

Some problems occurred during the course of fieldwork which modified some procedures, principally in limiting the total amount of working time while in the field. Security clearance delays regarding access to installations and permission to take photographs in restricted areas cut the total available time in the field by one sixth. The impact of this time loss was partially mitigated due to time saved by not surveying asphalt surfaces in many security clear zones. The bulldozed firebreaks within the external security clear zones at VTS, SLC-3, and SLC-4 provided optimal surface visibility which allowed still more time to be recovered. With the aid of Base Security personnel, access to particular installations was scheduled to minimize time loss in transit between installations. Unfortunately, VTS, which was the first installation inspected, required a great deal more time to survey and test than had originally been allotted. However, it was necessary to follow the schedule planned with Base Security to gain access to Titan Ground Guidance Station, SLC-3 and SLC-4; thus some additional time in transit was expended returning to VTS.

Other delays were encountered at SLC-3 and SLC-4. Internal facility yard fences between east and west launch complexes at both SLCs had to be walked around, and gaining access to a fenced-off area in SLC-4 caused a minor delay. A safety procedures briefing and safety check-ins cost the in-facility group at SLC-4 on hour of work time.

The security fence at Titan Ground Guidance Station had been pulled back to encompass a much smaller area than indicated on the 1"=400' map. The same was true on a much reduced scale at Atlas Ground Guidance Station. However, the security fence at SLC-4 enclosed all support facility buildings for that installation, thereby encompassing a larger area than indicated on the map. Thus, time saved at Titan and Atlas Ground Guidance Stations was lost at SLC-4.

The total lost time affected the STP excavation, reducing the number from 25 to 15. However, the utility of STP data is somewhat limited: soils were relatively homogeneous in all excavated areas, making soil disturbance difficult to identify within a small excavation unit. The depth of deposit was fairly accurately determined at SBa-793 at VTS and SBa-537 at SLC-4, but loose sandy soil at SBa-917 at VTS created a situation in which it was very difficult to determine accurately the vertical provenience of cultural materials from lower excavation levels.

The following table lists the date each military installation was investigated.

Table 1: Dates of Investigation

February 17:	VTs
February 18:	VTs Titan Ground Guidance Station SLC-4
February 19:	SLC-3 Atlas Ground Guidance Station Building 660 VTs

#### 4.2 Laboratory Procedures

The laboratory analysis of cultural remains recovered during security clear zone surface collection and subsurface investigations was performed at the University of California at Santa Barbara under the supervision of the co-directors. The sorting of the cultural materials was done by assistants trained in archaeological laboratory techniques.

All cultural remains were placed in 1/32 inch mesh screen and were washed thoroughly, except for a charred basketry fragment imbedded in asphaltum. All residues were then sorted into the following categories: rocks, plant material, lithics, bone, shell, charcoal, prehistoric asphaltum, historic material, and other artifacts. After the initial sorting, the material was checked for accuracy by a field director before cataloging. Modern organic material was discarded without being counted or weighed. All artifacts were weighed, counted, and cataloged using UCSB cataloging procedures, by Santa Barbara County site number when applicable, project area (e.g., SLC-3), and excavation depth. All materials are cataloged under UCSB Department of Anthropology Accession No. 274.

Cultural materials recovered during surface and subsurface investigations in the Vandenberg Security Clear Zone areas are listed in Appendix 1.

## 5.0 RESULTS OF INVESTIGATIONS

This section describes the results of investigations on an installation specific basis. In addition to discussions of archaeological resources where applicable, modifications of the security fencelines, and recent historic land modifications are noted. To briefly summarize the findings, no previously unrecorded archaeological sites were encountered during the course of this investigation; however, isolated archaeological materials were observed in disturbed contexts. The boundaries of SBa-793 were confirmed, the boundaries of SBa-917 and SBa-537 have been revised, the structural integrity of SBa-537 was found to have been completely destroyed, and SBa-1127 was found not to fall within the project area.

### 5.1 SLC-4

Archaeological materials occur at SLC-4 near the southeast corner of the security fence. The low density surface scatter extends 75 m east from the corner both inside and outside the fence (Map 2). A 9 x 9 m area 275 m east and outside of the southeast fence corner contained several Monterey chert flakes and a biface fragment of the same material (Figure 1c). These cultural materials are associated with SBa-537, recorded by Spanne in 1971 (Spanne 1971). The ground surface is presently greatly disturbed in all areas of the site. Severe bulldozer disturbance outside the security fence is a result of firebreak clearance. Construction of SLC-4W eradicated all evidence of the site within the facility yard save for a handful of Monterey chert flakes and several Mytilus californianus shell fragments on the surface. Of the two STPs excavated inside the fence, only STP 6 contained cultural materials: 3 Monterey chert flakes and 0.1 gm of Mytilus californianus from above 60 cm below surface. STP 8, excavated in the clear zone outside the security fence, and downslope from STP 6, contained historic construction materials to a depth of 40 cm below surface. Field data conclusively demonstrate that the spatial integrity of SBa-537 is entirely destroyed.

The security clear zone at SLC-4 is presently larger than indicated on the maps provided prior to fieldwork. Buildings 723, 725, 730, 731, and 739 are presently enclosed within the facility yard (Map 2). This additional fenceline was surveyed as well as the security fence between these structures and the SLC-4E and SLC-4W facility yards.

SBa-1127 is 120 m outside the project area, south of the SLC-4 installation on the opposite side of Spring Canyon. It was not investigated during the course of this project.

## 5.2 SLC-3

Six Monterey chert flakes and chunks were observed in a 490 m length of the security clear zone, centered on the south fence corner of the installation. Two were located along the inside of the southeast fence in a bulldozed fire-break. Of the 4 chert artifacts observed outside the fenceline, 3 occurred in small berms formed by bulldozers which cut a firebreak around the entire installation perimeter. This firebreak was cut 40-75 cm below surface and no cultural materials were observed in the bulldozer cut itself. Based on these data, it is evident that only a very low density surface scatter is present. The artifacts lie in a loose dune sand topsoil on a moderate slope and may occur in their present position because of natural downslope movement. The hilltop now occupied by SLC-3E at the top of this slope may have had an archaeological site on it prior to construction; it offers an excellent view and is in close proximity to Bear Creek. The cultural materials found during the course of this investigation may be peripheral to a former site in this locality, or they may have been displaced by natural downslope movement or SLC-3E construction activities. Because of the depositional context and low artifact density (approximately 5-10 m between items) over such a large area, these remains were recorded as isolated finds rather than as an archaeological site. No cultural materials were collected from this locality.

The security fence at SLC-3 does not encompass Buildings 760-762, 764-765, and 768, as indicated on the project map. The fence presently runs along the northeast side of Alden Road for 150 m to avoid encircling these structures (Map 3).

## 5.3 Atlas Ground Guidance Station

Field investigation at this installation revealed no archaeological materials, but what appears to be a substantial amount of grading and filling associated with construction of the facility was encountered throughout the security clear zone. The security fence at the south end of the installation has been moved north approximately 54 m to abut the southern edge of asphalt pavement inside the facility yard. The present position of this fence is indicated on Map 4.

## 5.4 Building 660

No archaeological materials were visible at this installation (Map 5). An undetermined amount of grading had been done within the security clear zone in connection with construction of the facility. The entire interior of the facility yard is paved with asphalt.

### 5.5 Titan Ground Guidance Station

Isolated artifacts were observed and recovered from a dirt roadway inside the present northeast fence. Two utilized or retouched Monterey chert flakes were found midway along the inside of the northeast fence and 60 cm northwest of the east fence corner. No other cultural materials were observed inside the security fence. Eight meters north of the east fence corner a low quality Monterey chert outcrop was observed. No culturally modified chert was associated with this feature. However, one Mytilus californianus shell fragment was recovered from STP 5 in the 0-20 cm level below surface. The isolated chert artifacts previously mentioned were of a different color and quality of chert than that in the outcrop. No site number was given to the outcrop, nor to the locality in which the two isolated artifacts were observed.

The security fence at Titan Ground Guidance Station has been substantially modified from the representation on the maps provided prior to fieldwork. The west and northeast fences have been substantially collapsed inward (Map 6). Only the present security clear zone around the installation was investigated.

### 5.6 VTS

Archaeological resources occur in roughly half of the security clear zone surrounding the VTS facility. These resources are associated with SBA-793 at the northwest end, and SBA-917 at the southeast end of the installation, both recorded by Spanne in 1971 (Spanne 1971). The current distribution of surface cultural material verifies Spanne's site boundaries at SBA-793 (Map 7). Artifacts observed and recovered from surface and subsurface include a burned basal fragment of basketry with asphaltum from the surface of a rodent burrow (Figure 1b), a proximal end fragment of a large expanding stem projectile point (Figure 1a), 4 utilized or retouched Monterey chert flakes, Monterey chert chipping detritus, and Haliotis and Mytilus sp. shell fragments. All cultural materials occur in a light to moderate density distribution across the entire site, with lithic chipping detritus the most abundant material.

Five shovel test pits were excavated in SBA-793. The depth of the medium brown sandy loam which contains the cultural materials grades from 10 cm below surface at STP 14 inside the north fence corner, to 60 cm below surface at STP 1 outside the west fence in the security clear zone. This soil is relatively homogeneous and overlies a sterile gray clayey subsoil with iron concretions. It was not possible to determine from STP data whether the soils at SBA-793 were intact or had been mechanically altered during construction of the VTS installation. Two informants who had witnessed the construction activities disagreed on whether the



northwest end of the facility yard had been graded or filled. Topographic features did not aid in determining the extent of the site areas in the security clear zone and facility yard; however, graded areas were clearly visible to the west of the installation, adjacent to Bishop road. The topography dips below the roadbed to the north, creating a swale that continues 20 meters northward. This depression appears to have been created by grading. The topography then rises 60 cm, creating a bench 30 meters north-south and 75 m east-west. This bench may be a relatively intact portion of SBA-793 which escaped extensive grading.

Surface and subsurface inspections of SBA-917 at the southeast end of the VTS installation have resulted in a substantial addition to the total site area (Spanne 1971; Map 7). An additional area of moderate to high density cultural materials extends 215 m to the northwest from Spanne's previous northwest site boundary. This 75 x 215 m area straddles the ridge top now occupied by the VTS facility. The new site area is bisected northwest to southeast by the northeast security fence. The northwest boundary of the new site area is defined by a 15 m deep cut southeast of Building 23225. The southwest boundary follows the 950' contour line through the center of the facility yard, skirting immediately east of the radar dome, Building 23201. The northeast boundary runs from the 905' contour at the west end of Spanne's 1971 site boundary to the 935' contour due east of Building 23217, roughly following the downslope side of a freshly bulldozed firebreak. Except for the northwest boundary re-defined for SBA-917, Spanne's 1971 site boundaries are still correct.

Six shovel test pits were excavated in SBA-917 to collect data on subsurface content, integrity, and site depth. Loose medium orange-brown sandy soil in all STPs gave excavators difficulty with sidewall control. This caused some problems with maintaining precise 20 cm excavation levels. Monterey chert flakes were recovered from all levels to 30 cm below surface in STP 4 at the northeast end of the site in the facility yard. Monterey chert flakes and asphaltum were recovered from all levels above sandstone bedrock, reached at 85 cm below surface in STP 12 in the security clear zone inside the southeast end of the security fence. Soils further downslope inside the fenceline are shallower, as indicated by STP 9 in which bedrock was reached at 60 cm below surface.

All of the new site area has been subjected to visible surface disturbance from grading and brushing. Some natural downslope movement may have also occurred. The area of SBA-917 previously identified by Spanne has also been subjected to some visible surface disturbance. Grading for and subsequent erosion along the transmission line which bisects the site along its entire length have disturbed artifact

provenience. Looting of ground stone pestles and mortars reportedly occurred during construction. Looting of projectile points is reported to be ongoing along the transmission line after rains, according to one informant. Bulldozer disturbance was visible in roughly 50% of the previously recorded site area, distributed evenly throughout the site.

The severe time handicap did not allow for STP excavation toward the center of the previously recorded area. Thus, the subsurface content and depth of deposit are still unknown in this area. However, it was noted that surface artifact density decreases from northwest to southeast across the site. The untested downslope area to the southeast may contain a thinner deposit, if sparser surface artifact densities in this area are true indicators of subsurface cultural contents.

## 6.0 SIGNIFICANCE

Evaluations of significance will be discussed in light of criteria established for nomination eligibility to the National Register of Historic Places. Two criteria are applicable to prehistoric cultural properties. They are quality of integrity, and the potential to yield information of importance to prehistory (36 CFR 800.10). SBa-537, 793, and 917 will be evaluated against these criteria. Because it is difficult to predict the direction of future archaeological research, significance criteria assessing a property's potential to yield information of importance to prehistory must be broad enough to guide resource management decisions that will promote the preservation and representation of as many spatial and temporal cultural manifestations as possible. Glassow et al, (1976:102) devised such a set of archaeological criteria in order to assess the significance of archaeological sites investigated during the Vandenberg STS Archaeological Project. The five variables chosen were habitat, physical characteristics, temporal distinctiveness, and activity diversity. Quality of preservation or integrity of the archaeological site (as determined in 36 CFR 800.10a) was a final variable defined. Present significance assessments will affect management decisions concerning sites that could potentially contribute to the Vandenberg regional archaeological data base. The National Register of Historic Places criteria concerning the potential of a property to yield information of importance to prehistory will be discussed utilizing the variables defined by Glassow, et al, (1976).

### Habitat:

Glassow et al, (1976:102) believe that the prehistoric activities and remains at a given site are related to surrounding exploitable natural resources. One of the goals of significance assessment is to encourage the preservation of sites from as many biotic communities in a region as possible. Greater significance should be given to a site that is located within a community that has not been adequately investigated previously or that is the last one remaining within this habitat.

SBa-537 is located within a chaparral or coastal sage scrub vegetation community that is well represented by several sites that have been previously recorded and studied during the Vandenberg STS Archaeological Project; SBa-663 and SBa-665 are examples (Glassow et al, 1976:70,71). On the other hand, little archaeological investigation has been carried out in the soft chaparral vegetation zone of the Casmalia Hills where SBa-793 and SBa-917 are located. Hence, the uninvestigated habitat surrounding SBa-793 and SBa-917 enhances their archaeological significance, while

this attribute is not a strong factor in SBa-537 significance determinations.

#### Physical Characteristics, Temporal Distinctiveness, and Activity Diversity:

These three research potential variables are grouped together because a great deal of sub-surface site testing is often necessary in order to evaluate their relative importance. Information concerning the spatial dimensions, number of cultural components, and their distinctiveness and spatial clustering within archaeological remains should contribute to the research potential of an archaeological site (Glassow et al, 1976:104, 105). But this type of potential data, as well as temporal definition and recognition of activity diversity, can rarely be identified from the results of a limited testing program such as the one this report discusses (Glassow et al, 1976:107).

SBa-537 does seem to have been within a zone of ephemeral visitation and exploitation based on the shallow deposit and limited variety of artifactual constituents. Cultural remains and reports of varied implements of ground and chipped stone at SBa-793 and SBa-917 seem to indicate a more intensive history of habitation. However, a very large number of shovel test pits, are necessary to provide a more detailed picture of archaeological activity and exploitation at SBa-793 and SBa-917 than could possibly be excavated during the present project. Significance assessments must therefore be based on other criteria.

#### Quality of Preservation or Integrity

The state of preservation or quality of integrity of an archaeological site is an influential criterion of significance determinations cited in 35 CFR 800.10. Glassow et al, 1976:105, 106) stresses that those sites where historical disturbance is limited to upper depositional levels might still contain intact earlier components that are of potential archaeological importance.

Unfortunately, cultural remains at SBa-537 have been extensively disturbed by a series of terraced firebreaks, jeep roads, and SLC-4W construction. The original structure and context of the deposit has been lost. This fact severely limits the archaeological significance and research potential of the site.

The history of disturbance to SBa-793 and SBa-917 is more complicated and almost as catastrophic. Based on grading plans drawn prior to construction, large areas of the site have been graded and displaced or now lie under the VTS installation. Although intact lower levels of the site may not have been impacted and remain intact, it is impossible to judge whether midden soils that were tested during the

project are primary or secondary deposits due to their homogeneous soil color, texture and cultural inclusions. The small unit size used during this investigation did not prove effective in providing data for determination of depositional context; longer stratigraphic profiles would be necessary for such a determination in this case. The previous construction activities at VTS has produced irresolvable problems in attempting to assess the integrity of SBa-793 and SBa-917 deposits.

In summary, extensive disturbance of SBa-537 deposits has eliminated all significance of integrity associated with this site and the site is not considered eligible for nomination to the National Register of Historic Places. The significance of sites SBa-793 and 917 is more difficult to ascertain. However, the presence of SBa-793 and 917 cultural remains within the particular environmental zones defined in this report contribute to the understanding of prehistoric land-use patterns. Although stratigraphic context associated with SBa-793 and 917 occupation has possibly been extensively destroyed in some areas, the type of activities represented at these sites and surrounding environments can be inferred. The sites represent activity loci and potential data that may contribute to the understanding of Vandenberg prehistoric regional settlement systems. Thus, SBa-793 and 917 must be considered potentially capable of yielding information important to prehistory and therefore eligible for nomination to the National Register of Historic Places until additional, more extensive investigations are undertaken that prove otherwise.

In addition, SBa-537, 793, and 917 are significant to the local Native American community. Disturbance of any prehistoric site regardless of content is highly objectionable to some members of this group. However, only the local Native American community may completely assess the significance of the above archaeological properties in terms of their interests and concerns.

## 7.0 PROPOSED IMPACTS

Cultural resources within the security clear zones at the six military installations at VAFB will be subject to direct impacts resulting from twice a year mechanical mowing or other feasible alternatives. Cultural resources were observed at VTS, SLC-3, SLC-4 and Titan Ground Guidance Station. The resources at SLC-3 and Titan Ground Guidance Station are isolated artifacts. Those observed at Titan Ground Guidance Station were surface collected during the course of fieldwork because they were located on dirt roads with a high probability of being destroyed. Isolated artifacts of SLC-3 occurred in bulldozed firebreaks. Prehistoric archaeological sites in the impact zones are SBa-793 and 917 at VTS, and SBa-537 at SLC-4.

Each security clear zone project area will be similarly effected by the potential direct impacts. At each location, previous surface disturbance has occurred as a result of either grading, filling, or bulldozing for firebreaks. Mechanical mowing will also cause surface disturbance. Artifacts lying on the ground surface will be damaged by mower blades and tires, and they can be expected to be displaced small distances when struck by mower blades. Artifacts brought to the surface by burrowing rodents will be particularly subject to damage and movement because of their position in small, soft soil mounds (an example being the basketry fragment at SBa-793). Continual movement of subsurface artifacts to the surface and their redistribution across the ground surface can be expected to eventually alter both vertical and horizontal site structure. The degree of alteration will vary with the size of the rodent population and the length of time sites are subject to mowing. Based on surface indications of rodent burrowing, SBa-537 and SBa-917 presently suffer from only slight rodent disturbance, but SBa-793 is severely rodent disturbed. The most extensive site structure disturbance and ensuing loss of archaeological integrity is therefore expected at SBa-793. The combination of rodent and mowing impacts will significantly increase the level of disturbance to SBa-793. If no mitigating measures are taken, disturbance to artifacts and site structure will be severe in the long run at SBa-793.

## 8.0 RECOMMENDATIONS

SBa-537 at SLC-4 and the isolated artifacts at SLC-3 and Titan Ground Guidance Station occur in secondary depositional contexts of low density and diversity which are presently of extremely limited research significance. Impacts on these cultural resources resulting from proposed vegetation mowing activities do not require mitigation.

Due to the limited interpretive value of data collected during this project from SBa-793 and SBa-917, it has not been possible to fully determine the integrity and significance of these sites in terms of National Register of Historic Places eligibility criteria. However, a significant density and diversity of artifacts representative of past activities at these localities are present, and significant damage will occur to these materials as a result of vegetal removal. Areas of intact deposit presumably exist at both sites, yet neither their exact location nor significance can be determined with the data at hand. Thus, potential subsurface impacts from undefined future developments at these sites will require pre-mitigation assessment beyond the scope of the present project. In the event such an investigation is deemed necessary, it is recommended that excavation test unit size provide sidewall soil profiles not less than 1 m in length to facilitate integrity assessments. Improved vertical provenience control is also a necessity. Complete grading histories must be provided to the investigator prior to project design so that test unit locations can be selected to yield the most productive data.

In order to mitigate direct impacts of planned vegetation removal on SBa-793 and 917, the following measures are recommended:

1. Increased control of the burrowing animals is advisable to minimize the destructive impact vegetation mowing would have on subsurface cultural materials transferred to the surface.
2. If rodent control is either impossible or ineffective, it is suggested that a systematic surface collection be made as soon as possible and preceding vegetation clearing activities in the future in order to create a collection of relatively undamaged artifacts.
3. In security clear zone areas within site boundaries, vegetation and brush removal should be done by hand, with mechanical mowing possible outside areas of archaeological sensitivity. This plan would reduce potential damage to artifacts caused by crushing and displacement from tractors or mower blades.

A significant impact on the cultural resources of SBa-793 and 917 has been the looting of artifacts by VTS

personnel. This looting occurs along the transmission line outside VTS to the southeast. The mitigation measure for this impact follows.

1. Looting should be discouraged and curtailed, especially after rain has caused previously buried artifacts to erode and become visible. Enforcement of the Antiquities Act of 1906 (P.L. 59-209; 16 U.S.C. 431-33), the Archaeological Resources Protection Act of 1979 (P.L. 95-96; 16 U.S.C. 470), and the general commitment of the United States Armed Forces to the preservation of sensitive cultural resources is strongly urged.



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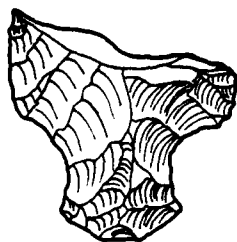
United States Department of the Air Force

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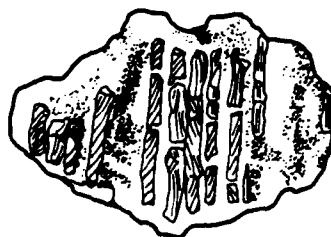
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APPENDIX



1a. Stemmed Point  
SBa-793  
Acc. No. 274-4



1c. Basketry Fragment  
SBa-537  
Acc. No. 274-1



1b. Biface  
SBa-537  
Acc. No. 274-5

# FIGURE 1

VAFB Security Clear Zone  
Artifacts

(actual size)

ACCESSION 274 CATALOG TABLE 2  
SECURITY CLEAR ZONE

CATNUM	SITE	UNIT	LEVEL	OBJECT	MCDIF1
1	537		000000	BIFACE>17GM.#13	RETOUCHED/UTIL.
2	.		000000	FLAKE	UTILIZED
3	.		000000	FLAKE	RETOUCHED/UTIL.
4	793		000000	BIFACE>3GM<17GM#6	.
5	793		000000	BASKETRY	.
6	793	1	000020	SHELL	.
7	793	1	000020	FLAKE	UTILIZED
8	793	1	000020	FLAKE	.
9	793	1	000020	FLAKE	.
10	793	1	000020	STONE/GRAVEL	.
11	793	1	020040	FLAKE	.
12	793	1	040060	SHELL	.
13	793	1	040060	FLAKE	.

CATNUM	MATL	ASPHALT	CCBTEX	QUANT	WEIGHT
1	MCNT. CHERT			1	29.4
2	FRAN. CHERT			1	14.6
3	MCNT. CHERT	Y		1	83.9
4	MCNT. CHERT			1	7.2
5	FIBER	PRES		1	11.0
6	HALIOTIS SP.			1	5.3
7	MONT. CHERT	Y		1	3.2
8	MCNT. CHERT	Y		2	0.9
9	MONT. CHERT			4	2.1
10	IGN. ROCK			1	31.7
11	MCNT. CHERT			6	3.4
12	SHELL			2	0.1
13	MCNT. CHERT			3	0.5

ACCESSION 274 CATALOG  
SECURITY CLEAR ZONE

CATNUM	SITE	UNIT	LEVEL	OBJECT	MODIF1
14	793	1	040060	FLAKE	RETOUCHED/UTIL.
15	793	2	000020	FLAKE	UTILIZED
16	793	2	000020	FLAKE	.
17	793	2	000020	CHUNK	.
18	917	3	000020	CHUNK	.
19	793	2	000020	CORE	.
20	917	3	020040	FLAKE	.
21	917	3	020040	FLAKE	.
22	917	3	020040	FLAKE	.
23	917	3	020040	CHUNK	.
24	917	3	040060	FLAKE	UTILIZED
25	917	3	040060	FLAKE	.
26	917	3	060080	GRND. STONE	.

CATNUM	MATL	ASPHALT	CORTEX	QUANT	WEIGHT
14	MCNT. CHERT			1	8.8
15	MCNT. CHERT			2	5.6
16	MCNT. CHERT			5	2.0
17	MCNT. CHERT	Y		1	5.5
18	MCNT. CHERT	Y		1	15.5
19	MCNT. CHERT			1	16.8
20	MCNT. CHERT	Y		1	6.9
21	MCNT. CHERT			1	0.4
22	MCNT. CHERT			1	0.1
23	MCNT. CHERT	Y		1	11.3
24	MCNT. CHERT	Y		1	2.8
25	MCNT. CHERT			2	8.7
26	SANDSTONE			1	36.4

ACCESSION 274 CATALOG  
SECURITY CLEAR ZONE  
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CATNUM	SITE	UNIT	LEVEL	OBJECT	MODIF1
27	917	4	000020	FLAKE	.
28	917	4	000020	NAIL	.
29	917	4	020040	FLAKE	.
30	917	4	020040	CHARCOAL	.
31	917	4	040060	FLAKE UTILIZED	
32	917	4	060080	CHARCOAL	.
33	.	5	000020	SHELL	.
34	.	5	000020	MINERAL UNMCD.	
35	537	6	040060	FLAKE	.
36	537	6	040060	SHELL	.
37	537	8	000020	MORTAR	.
38	537	8	000020	SHELL	.
39	537	8	000020	GLASS	.

CATNUM	MATL	ASPHALT	CCBTEX	QUANT	WEIGHT
27	MONT. CHERT			1	0.2
28	IRON			.	5.6
29	MONT. CHERT			2	0.5
30	CHARCOAL			1	0.1
31	MCNT. CHERT			1	3.1
32	CHARCOAL			2	0.1
33	SHELL			3	0.1
34	MONT. CHERT			.	265.8
35	MCNT. CHERT			1	0.7
36	SHELL			3	0.1
37	PORTLAND CEMENT			2	109.3
38	MYTILUS SP.			7	5.5
39	GLASS			2	0.1

ACCESSION 274 CATALOG  
SECURITY CLEAR ZONE

C A T N U M	S I T E	U N I T	L E V E L	O B J E C T	M O D I F I C A T I O N	A S P H A L T U M	C O N T A I N E R	Q U A N T I T Y	W E I G H T
40	537	8	020040	MINERAL	. PORTLAND CEMENT			2	9.5
41	537	8	040060	MINERAL	. SHALE			1	1.1
42	537	8	02004	MINERAL	. SHALE			1	11.6
43	917	9	000020	FLAKE	. MONT. CHERT			1	0.5
44	917	9	02004	FLAKE	. MONT. CHERT			1	0.1
45	917	9	040060	FLAKE	. MONT. CHERT			5	1.6
46	917	10	000020	FLAKE	. MONT. CHERT			9	2.4
47	917	10	020040	FLAKE	. MCNT. CHERT			6	0.4
48	917	10	020040	FLAKE	. CHALCEDONY			1	0.2
49	917	10	040060	FLAKE	. MONT. CHERT			16	1.7
50	917	10	060080	FLAKE	. MONT. CHERT			7	0.6
51	917	10	080090	FLAKE	. MONT. CHERT			10	1.9
52	917	11	000020	FLAKE	. MCNT. CHERT			3	2.1
53	917	11	020040	FLAKE	. MCNT. CHERT			1	0.1
54	917	1	000020	FLAKE	. MONT. CHERT			7	3.4
55	917	12	000020	SHELL	. SHELL			4	0.1
56	917	1	000020	CHARCOAL	. CHARCCAL			1	0.1
57	917	12	000020	MINERAL	. ASPHALTUM			.	27.9
58	917	12	000020	FLAKE	. MCNT. CHERT			4	2.0
59	917	12	020040	MINERAL	. ASPHALTUM			.	192.5
60	917	12	040060	MINERAL	. ASPHALTUM			.	12.3
61	917	12	040060	FLAKE	. MONT. CHERT			11	5.3
62	917	12	060080	FLAKE	. MONT. CHERT			10	1.6
63	917	12	060080	MINERAL	. ASPHALTUM			.	5.5
64	917	12	080085	MINERAL	. ASPHALTUM			.	5.2



ACCESSION 274 CATALOG  
SECURITY CLEAR ZONE

C A T N U M	S I T E	U N I T	L E V E L	O B J E C T	M O D I F I	M A T E R I A L	A S S E M B L Y	Q U A N T I T Y	W E I G H T
65	917	12	080085	FLAKE	.	MONT.	CHEBT	6	1.9
66	793	13	020045	FLAKE	.	MCNT.	CHEBT	1	0.5
67	793	14	000020	FLAKE	.	MONT.	CHEBT	1	0.1
68	793	15	000020	FLAKE	.	MCNT.	CHEBT	4	6.4
69	793	15	000020	MINERAL	.	MONT.	CHEBT	3	8.7

ACCESSION 274 CATALOG BY SITE  
SECURITY CLEAR ZONE

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SITE=.

C		O		M		A		
A	L	B		O		S	P	Q
T	U	E	J	D		M	H	U
N	N	V	E	I		A	A	A
U	I	E	C	F		T	L	N
M	T	L	T	1		L	T	T

2	000000	FLAKE	UTILIZED	FEAN. CHERT	1	14.6
3	000000	FLAKE	RETOUCHED/UTIL.	MCNT. CHERT	1	83.9
33	5	000020	SHELL	. SHELL	3	0.1
34	5	000020	MINERAL UNMOD.	MCNT. CHERT	.	265.6

SITE=537

CATNUM	UNIT	LEVEL	OBJECT	MODIFI
1		000000	BIFACE>17GM.#13	RETOUCHED/UTIL.
35	6	040060	FLAKE	.
36	6	040060	SHELL	.
37	8	000020	MORTAR	.
38	8	000020	SHELL	.
39	8	000020	GLASS	.
42	8	02004	MINERAL	.
40	8	020040	MINERAL	.
41	8	040060	MINERAL	.

CATNUM	MATL	QUANT	WEIGHT
1	MCNT. CHERT	1	29.4
35	MCNT. CHERT	1	0.7
36	SHELL	3	0.1
37	PORTLAND CEMENT	2	109.3
38	MYTILUS SP.	7	5.5
39	GLASS	2	0.1
42	SHALE	1	11.6
40	PORTLAND CEMENT	2	9.5
41	SHALE	1	1.1

ACCESSION 274 CATALOG BY SITE  
SECURITY CLEAR ZONE

SITE=793

CATNUM	UNIT	LEVEL	OBJECT	MODIF1
4		000000	BIFACE>3GM<17GM#6	.
5		000000	BASKETRY	.
6	1	000020	SHELL	.
7	1	000020	FLAKE	UTILIZED
8	1	000020	FLAKE	.
9	1	000020	FLAKE	.
10	1	000020	STONE/GRAVEL	.
11	1	020040	FLAKE	.
12	1	040060	SHELL	.
13	1	040060	FLAKE	.
14	1	040060	FLAKE	RETCUCHED/UTIL.
66	13	020045	FLAKE	.
67	14	000020	FLAKE	.
68	15	000020	FLAKE	.
69	15	000020	MINERAL	.
15	2	000020	FLAKE	UTILIZED
16	2	000020	FLAKE	.
17	2	000020	CHUNK	.
19	2	000020	CORE	.

CATNUM	NATL	ASPHALT	QUANT	WEIGHT
4	MCNT. CHERT		1	7.2
5	FIBER	PRES	1	11.0
6	HALIOTIS SP.		1	5.3
7	MONT. CHERT		1	3.2
8	MONT. CHERT		2	0.9
9	MONT. CHERT		4	2.1
10	IGN. BOCK		1	31.7
11	MCNT. CHERT		6	3.4
12	SHELL		2	0.1
13	MCNT. CHERT		3	0.5
14	MCNT. CHERT		1	8.8
66	MCNT. CHERT		1	0.5
67	MCNT. CHERT		1	0.1
68	MCNT. CHERT		4	6.4
69	MONT. CHERT		3	8.7
15	MONT. CHERT		2	5.6
16	MONT. CHERT		5	2.0
17	MCNT. CHERT		1	5.5
19	MCNT. CHERT		1	16.8

ACCESSION 274 CATALOG BY SITE  
SECURITY CLEAR ZONE  
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SITE=917

C A T N U M	L U N I T	O B J E C T	M C I F I	M A T E R I A L	A S P H A L T	C U A N T	W E I G H T
54	1	000020 FLAKE		. MONT. CHERT		7	3.4
56	1	000020 CHARCOAL		. CHARCOAL		1	0.1
46	10	000020 FLAKE		. MONT. CHERT		9	2.4
47	10	020040 FLAKE		. MCNT. CHERT		6	0.4
48	10	020040 FLAKE		. CHALCEDONY		1	0.2
49	10	040060 FLAKE		. MONT. CHERT		16	1.7
50	10	060080 FLAKE		. MONT. CHERT		7	0.6
51	10	080090 FLAKE		. MONT. CHERT		10	1.9
52	11	000020 FLAKE		. MCNT. CHERT		3	2.1
53	11	020040 FLAKE		. MONT. CHERT		1	0.1
55	12	000020 SHELL		. SHELL		4	0.1
57	12	000020 MINERAL		. ASPHALTUM		.	27.9
58	12	000020 FLAKE		. MCNT. CHERT		4	2.0
59	12	020040 MINERAL		. ASPHALTUM		.	192.5
60	12	040060 MINERAL		. ASPHALTUM		.	12.3
61	12	040060 FLAKE		. MCNT. CHERT		11	5.3
62	12	060080 FLAKE		. MONT. CHERT		10	1.6
63	12	060080 MINERAL		. ASPHALTUM		.	5.5
64	12	080085 MINERAL		. ASPHALTUM		.	5.2
65	12	080085 FLAKE		. MONT. CHERT		6	1.9
18	3	000020 CHUNK		. MONT. CHERT		1	15.5
20	3	020040 FLAKE		. MONT. CHERT		1	6.9
21	3	020040 FLAKE		. MONT. CHERT		1	0.4
22	3	020040 FLAKE		. MONT. CHERT		1	0.1
23	3	020040 CHUNK		. MONT. CHERT		1	11.3
24	3	040060 FLAKE	UTILIZED	. MONT. CHERT		1	2.8
25	3	040060 FLAKE		. MONT. CHERT		2	8.7
26	3	060080 GRND. STONE		. SANDSTONE		1	36.4
27	4	000020 FLAKE		. MONT. CHERT		1	0.2
28	4	000020 NAIL		. IRON		.	5.6
29	4	020040 FLAKE		. MONT. CHERT		2	0.5
30	4	020040 CHARCOAL		. CHARCOAL		1	0.1
31	4	040060 FLAKE	UTILIZED	. MONT. CHERT		1	3.1
32	4	060080 CHARCOAL		. CHARCOAL		2	0.1
43	9	000020 FLAKE		. MONT. CHERT		1	0.5
44	9	020040 FLAKE		. MONT. CHERT		1	0.1
45	9	040060 FLAKE		. MONT. CHERT		5	1.6

